California's Petroleum Market Overview

Investigating the Causes of California's
Petroleum Infrastructure Development Constraints
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Presentation Topics

- **California's petroleum market**
  - Crude oil
  - Refineries & distribution
  - MTBE phaseout
  - Ethanol supply & logistics
  - Price issues

Overview – Crude Oil

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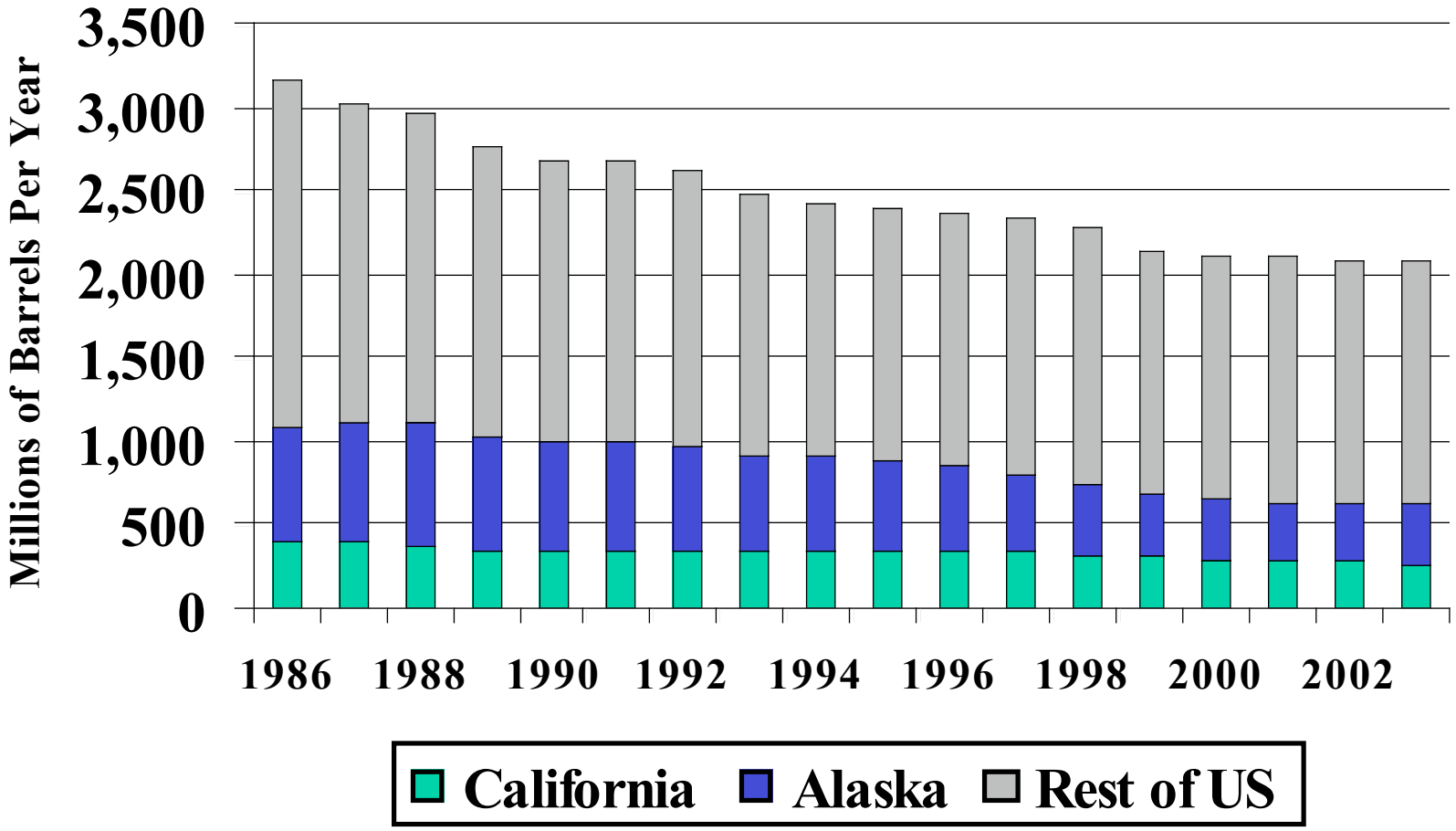
Overview - Crude Oil Supply

- 2003 U.S. crude oil production 2.1 billion barrels or 5.8 million barrels per day
- 2003 California crude oil production 278 million barrels or 762 thousand barrels per day (TBD)
  - 4th largest U.S. crude oil producer behind Louisiana, Texas, and Alaska
  - 55 percent enhanced recovery, mostly steam injection (2002)
- California crude oil production has declined 29 percent since 1986, Alaska 48 percent and the rest of U.S. by 30 percent
  - Rest of US production increased by about 1 percent compared to 2002
  - Alaska output remained steady between 2001 and 2003, reversing a declining trend that had continued for a decade
- California crude oil production declined 16 percent between 1998 and 2003, despite the fact that the value of the oil increased by 230 percent

United States Oil Production
1986 to 2003



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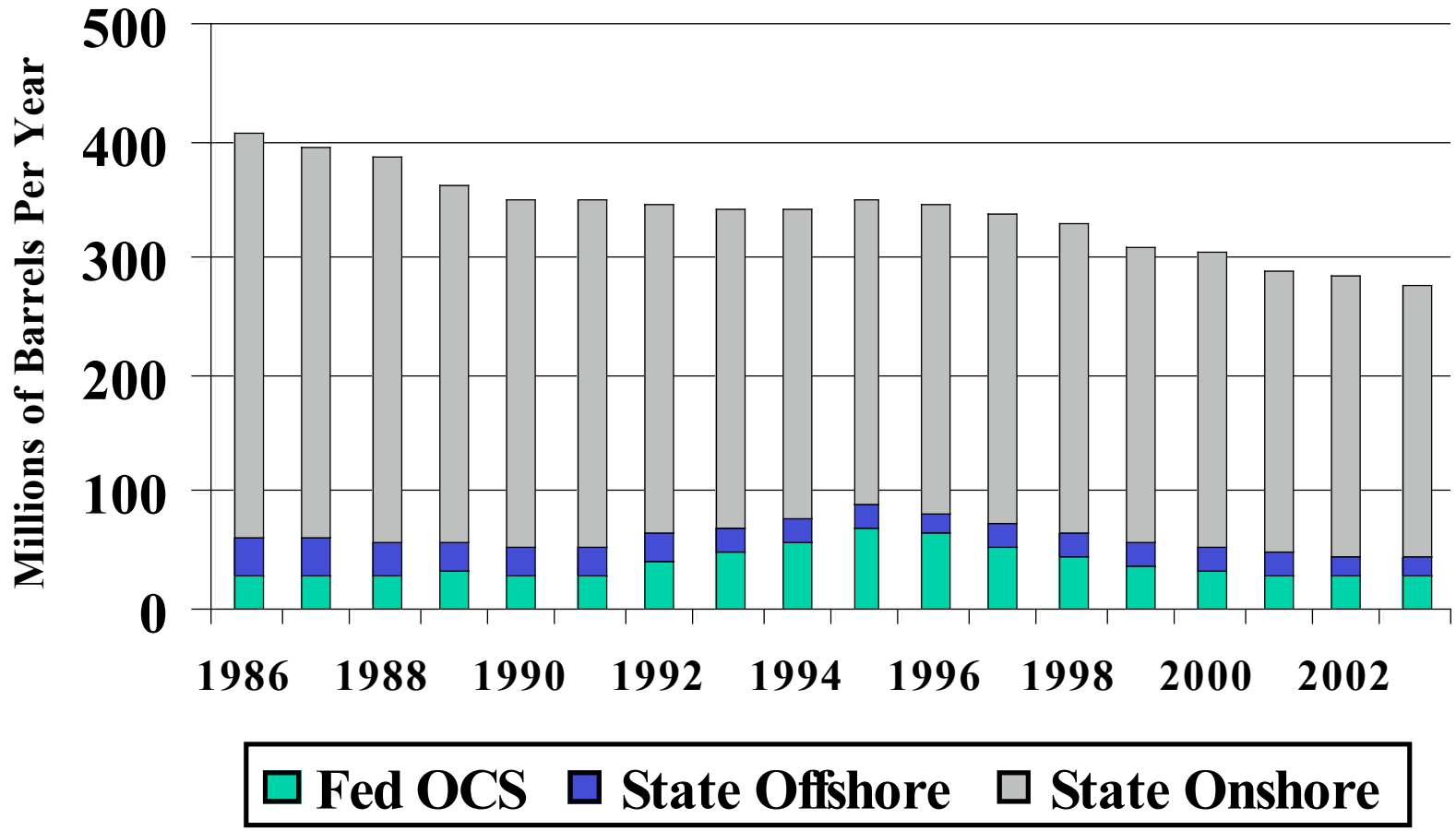
California Oil Production
1986 to 2003



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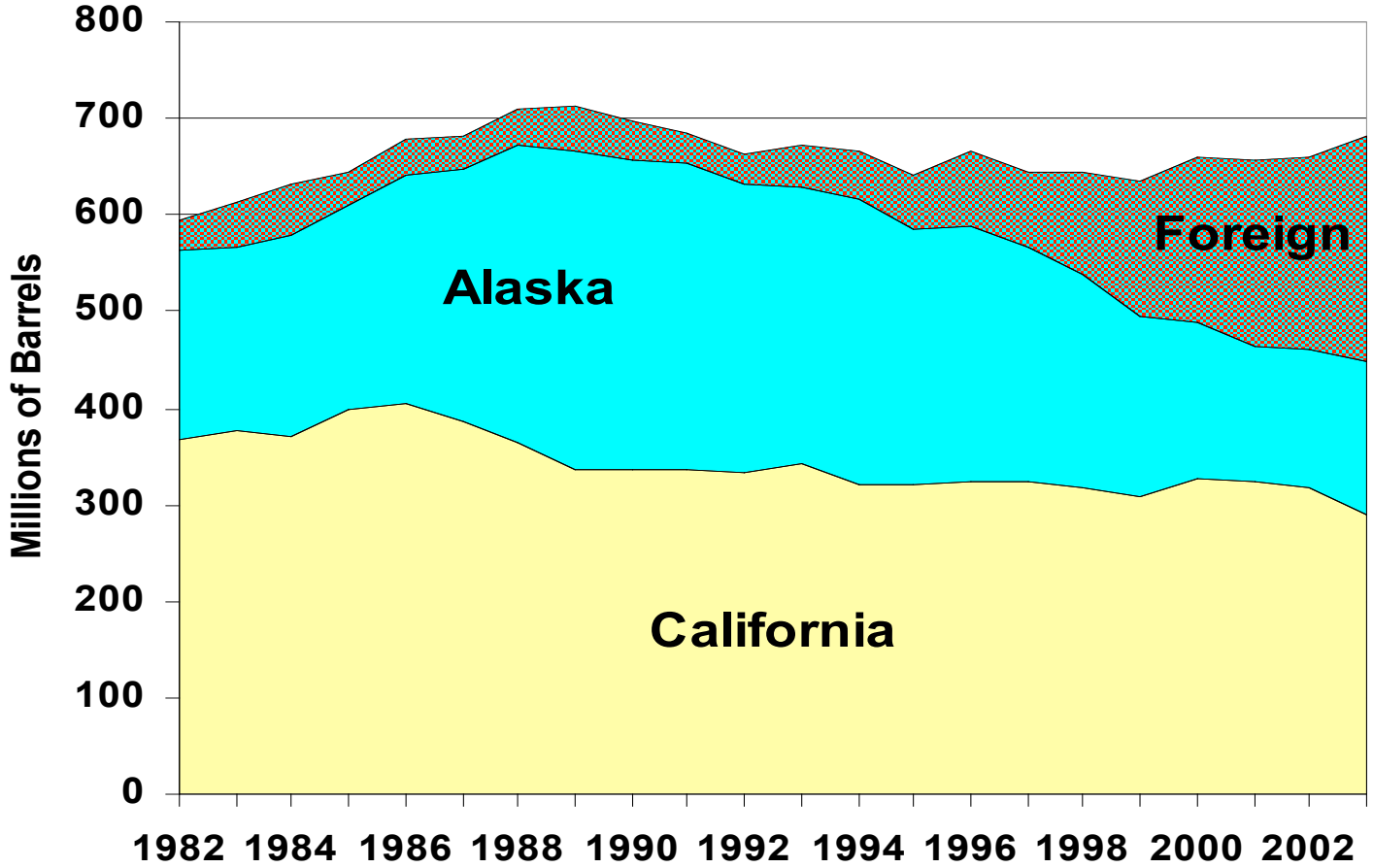
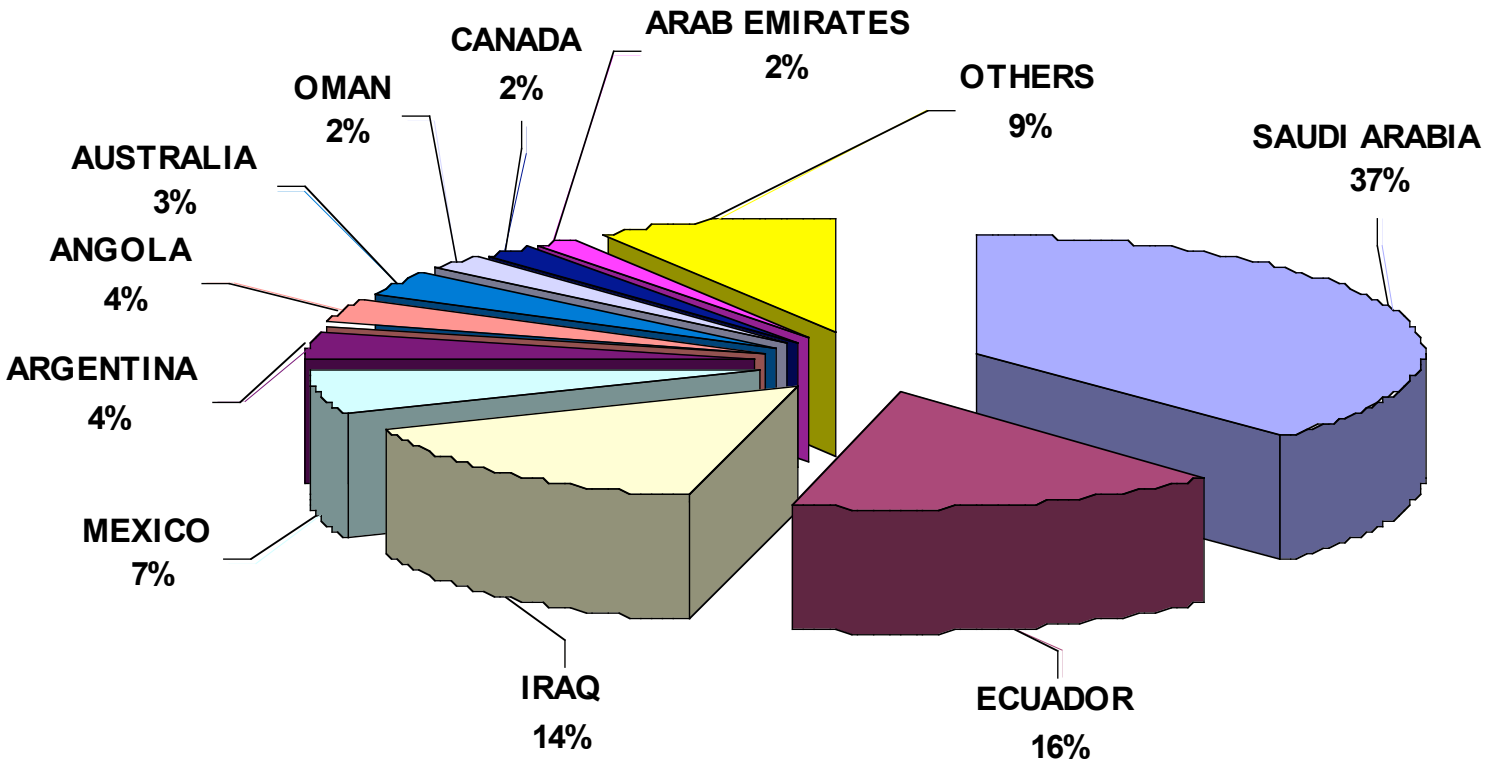
Domestic Crude Oil Use

- Global demand for crude oil estimated to top 80 million barrels per day for 2004
- U.S. refiners processed over 15 million barrels per day during 2003
  - Crude oil imports 9.6 million barrels per day, 63 percent of supply
- California refiners processed 1.9 million barrels per day during 2003
  - California 42 percent (793 TBD)
  - Foreign 34 percent (637 TBD)
  - Alaska 23 percent (439 TBD)
- Declining California production will be replaced with crude oil delivered by marine vessel
- Crude oil processing by California refineries expected to gradually increase

Crude Oil Sources For California Refineries 1982 - 2003



Foreign Crude Oil Sources For California Refineries - 2003



Importing Oil

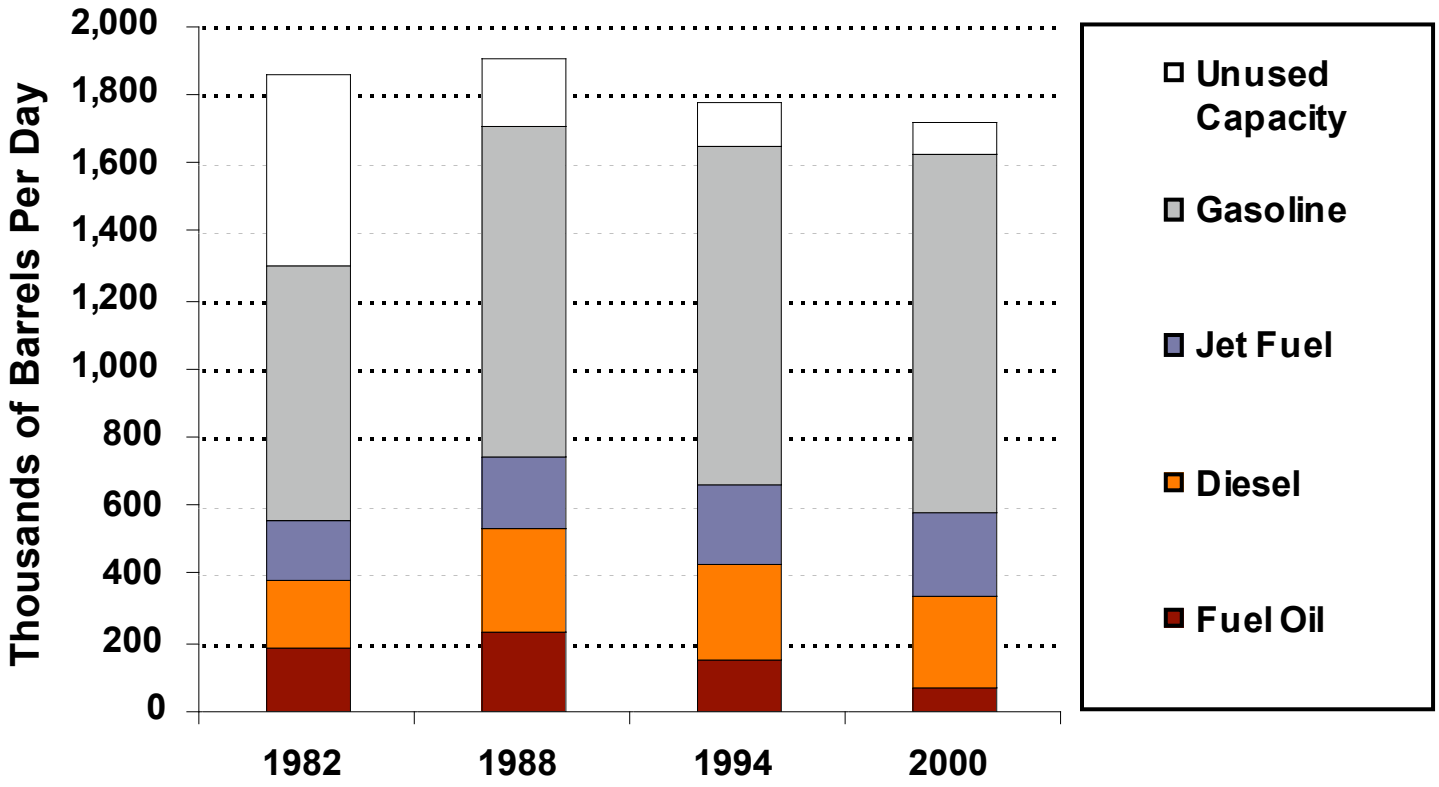
- Crude oil is a world-wide commodity
- Diversity of oil supplies has increased over the last 20 years, increased supply not from U.S.
  - FSU, Latin America & Canada accounted for an additional 1.3 million barrels per day in 2003 (compared to 2002)
- As long as refiners are able to purchase oil from anywhere in the world, events and trends that impact world crude prices will also directly impact the price of crude oil used by California refiners, regardless of origin
- Level of crude oil imports is not a driver for oil prices, global conditions determine prices

Overview – Refineries and Distribution

Overview - Refineries

- 13 refineries in California produce reformulated gasoline
- 9 smaller facilities produce diesel, jet fuel and asphalt
- California refineries are at or near capacity, especially during the summer months
- 1969 was the last time a new "grass roots" refinery was constructed in the United States – Benicia facility in Northern California previously owned by Exxon
- Independent refiners have increased their presence in California
- Expansion projects are possible. Permits and emission offsets are difficult to obtain
- Through the Integrated Energy Policy Report process, the Energy Commission recommended that the State take steps to streamline permitting

California Refinery Capacity



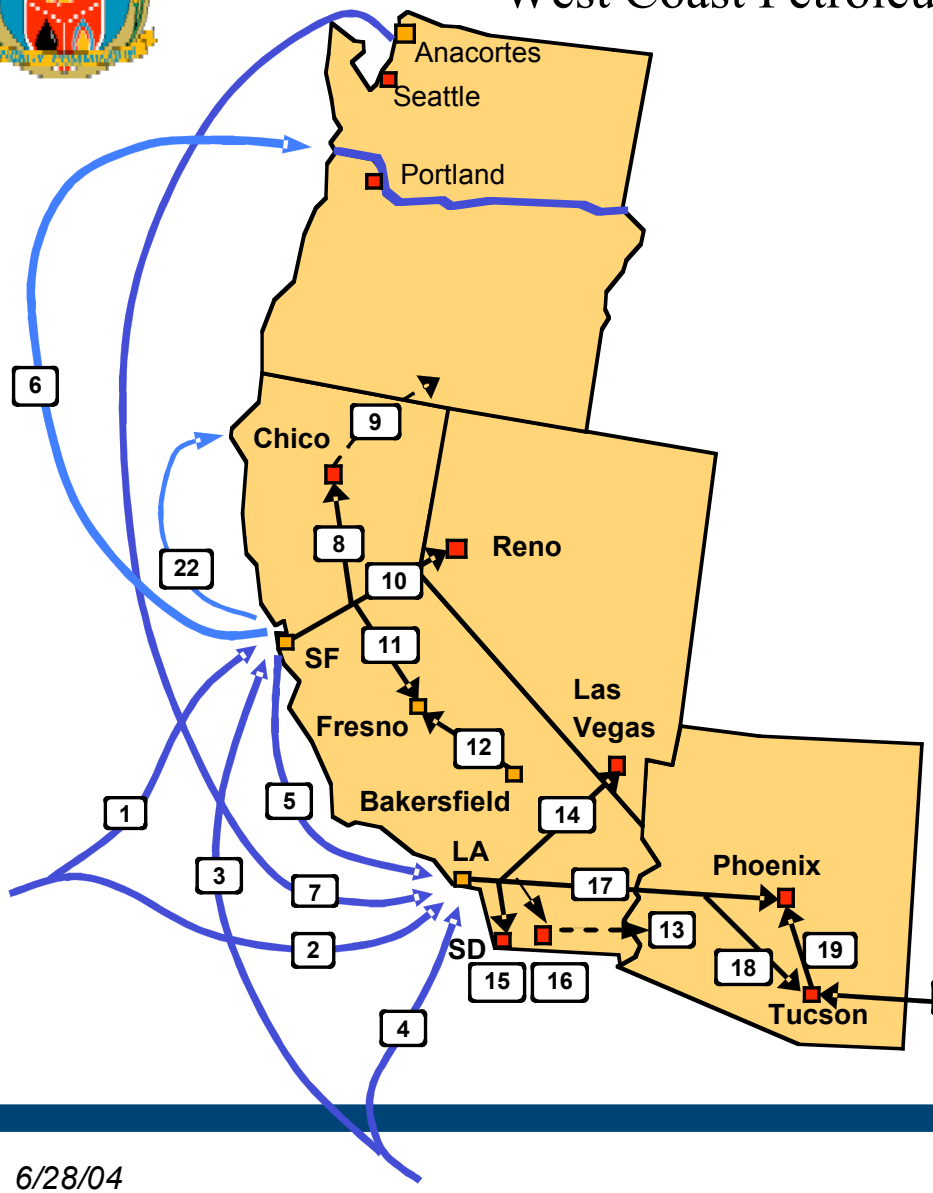
CA refinery runs and gasoline production at maximum capacity

Overview – Distribution of Petroleum Products

California is the Center of the West Coast Regional Market

- Refineries produce transportation fuels for use in California & other locations – 1,700 thousand barrels per day
- Exports of petroleum products by pipeline, marine vessel, rail car and tanker
  - By pipeline in 2003 to:
    - Nevada – nearly 100 percent – 151 TBD
    - Arizona – 61 percent – 139 TBD
  - By barge to:
    - Washington and Oregon
- Imports of petroleum products arrive via marine vessels and rail car

West Coast Petroleum Flows



1 Foreign Imports into Northen California
2 Foreign Imports into Southern California
3 US Gulf Coast Imports into Northern California
4 US Gulf Coast Imports into Southern California
5 Ship/barge San Francisco to Los Angeles
6 Ship/barge San Francisco to Portland
7 Ship/Barge Washington to Los Angeles
8 Kinder Morgan San Francisco to Chico
9 Truck Chico into Southern Oregon
10 Kinder Morgan San Francisco to Reno
11 Kinder Morgan San Francisco to Fresno
12 Kinder Morgan Bakersfield to Fresno
13 Truck Imperial to Western Arizona
14 Kinder Morgan Los Angeles to Las Vegas
15 Kinder Morgan Los Angeles to San Diego
16 Kinder Morgan Los Angeles to Imperial
17 Kinder Morgan Los Angeles to Phoenix
18 Kinder Morgan Los Angeles to Tucson
19 Kinder Morgan Tucson - Phoenix
20 Kinder Morgan El Paso - Tucson
21 Longhorn Pipeline (nearly complete)
22 Ship/barge San Francisco to Eureka

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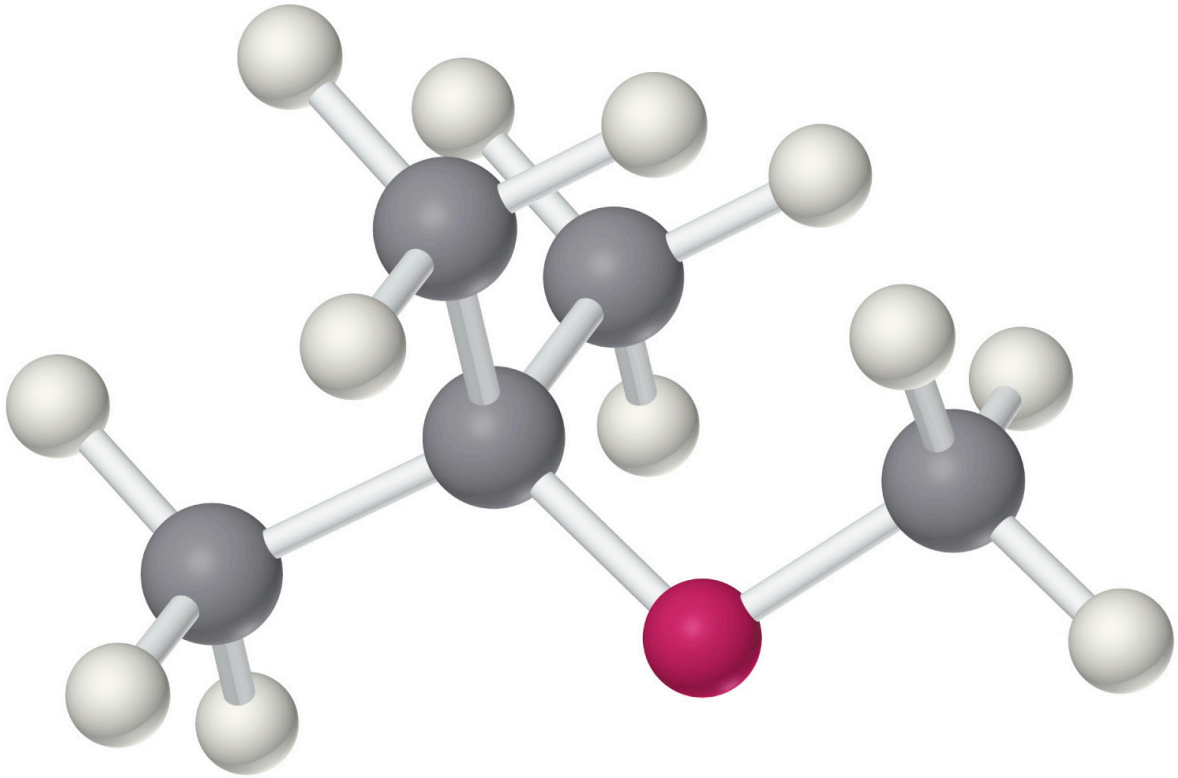
Status & Impacts of MTBE Phaseout



Methyl *tert*-butyl ether

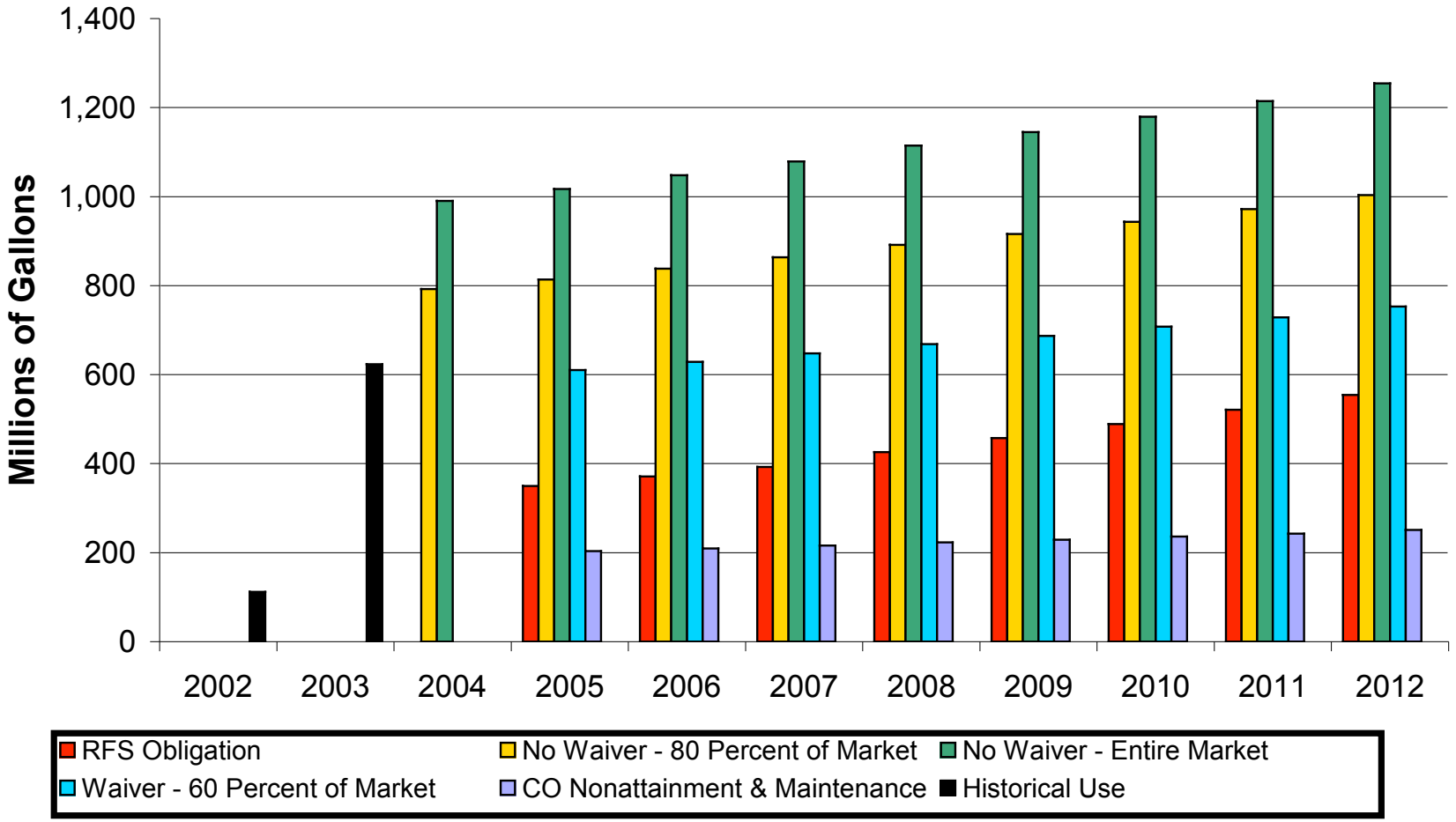
Status of MTBE Phaseout

- Phaseout of MTBE from California gasoline has been completed
  - 60 to 70 percent of the state's gasoline was produced without MTBE during 2003
  - Rest of California refiners completed the transition during November of 2003 (switch to winter gasoline)
  - Most service stations completed transition during January of 2004
  - Approximately 95 percent of the gasoline sold in California today contains ethanol, the remainder does not contain any oxygenates
- California regulations currently allow trace amounts of MTBE
  - Maximum concentration of 0.6 percent by volume
  - This "cap" will be lowered over time to 0.05 percent by volume
  - Imports of gasoline and components would have been curtailed if standard was set to zero

Impacts of MTBE Phaseout

- Demand for ethanol will increase
  - California using significant quantities of ethanol
    - 765 to 980 million gallons for 2004
- Ethanol supply is keeping pace
  - Energy Commission survey (October 2003) of ethanol industry concluded that supply should be sufficient to meet California's incremental ethanol demand
  - Current U.S. ethanol production capacity approximately 3.3 billion gallons per year, will increase to 4 billion gallons by end of 2006 (plants under construction)

Projected California Ethanol Use
High Case Gasoline Demand - 3 Percent Per Annum



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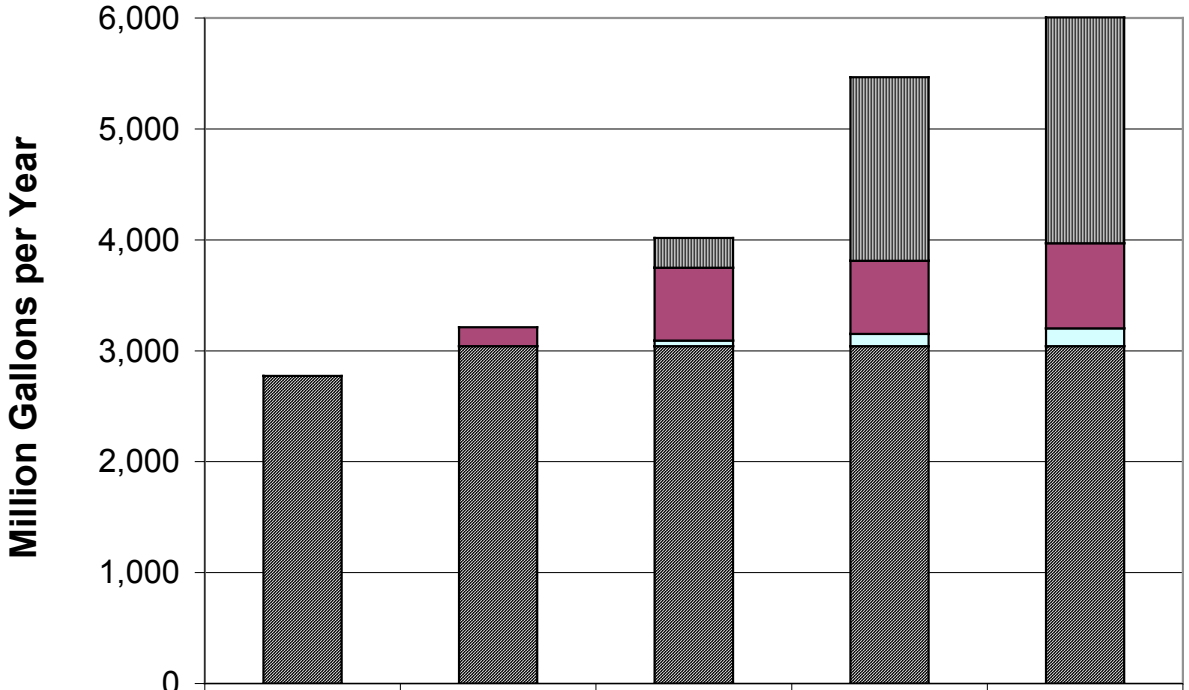
Projected USA Ethanol Capacity
@ End of Year

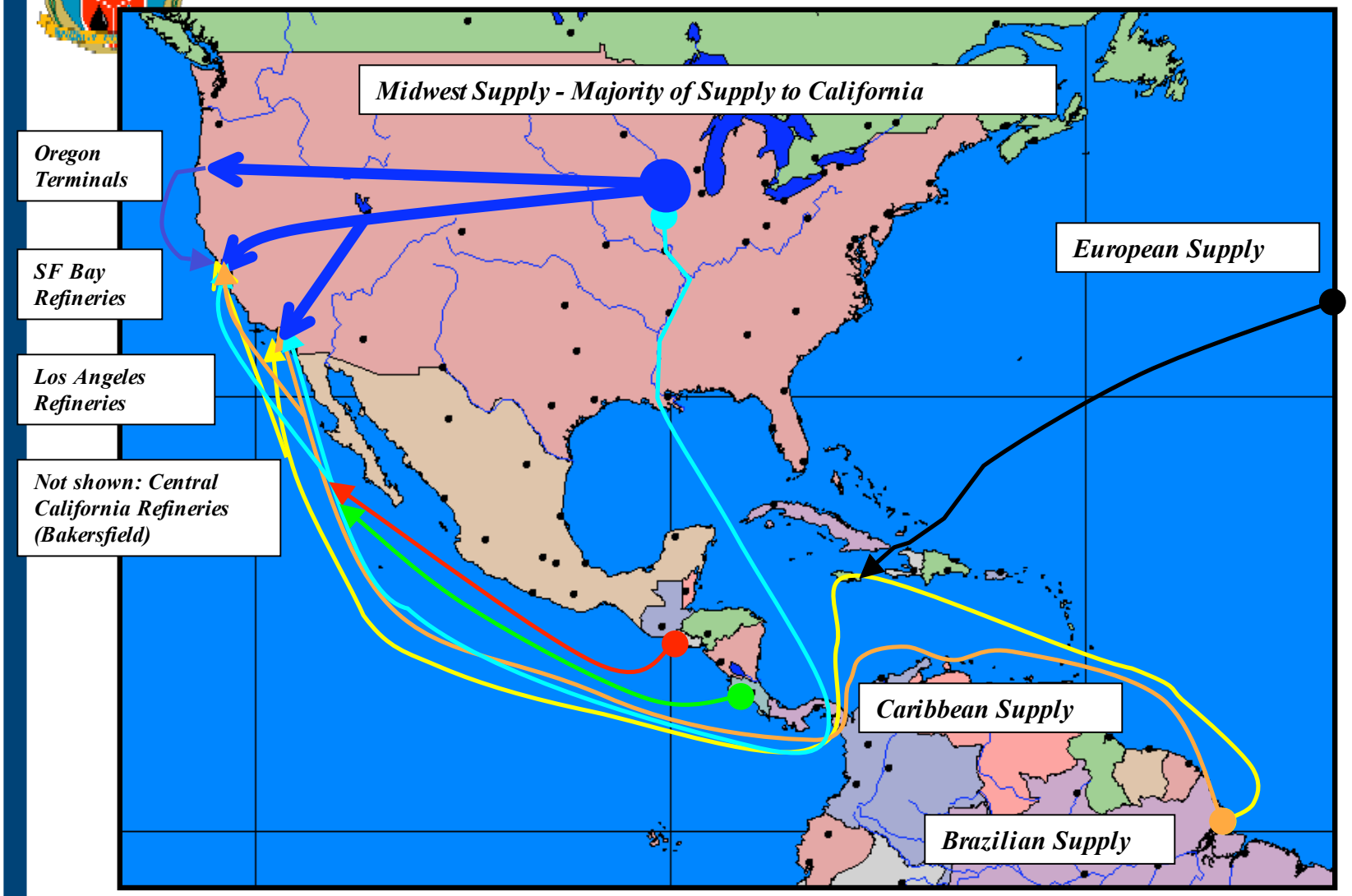


	2002	2003	2004	2005	2006
Planned	0	0	270	1655	2037
Under Construction	0	170	657	657	767
Expansions of Existing			50	112	161
Existing (as of 10/03)	2773	3041	3041	3041	3041

Impacts (cont)

- Ethanol logistics
  - Large shipments of ethanol began to arrive in California during December of 2002 – no significant problems to date
  - Ethanol supplies delivered to California via rail and marine vessel from Midwest & Caribbean sources
  - Ethanol is delivered to main staging areas before being trucked to gasoline terminals
  - Modifications completed to allow terminal in Southern California to receive “unit trains”
  - Refiners will try and keep ethanol inventories at high levels as a hedge against a potential interruption of deliveries
  - Pipeline operators do not ship ethanol through their systems due to increased potential for pipeline corrosion

Ethanol Sources and Transportation



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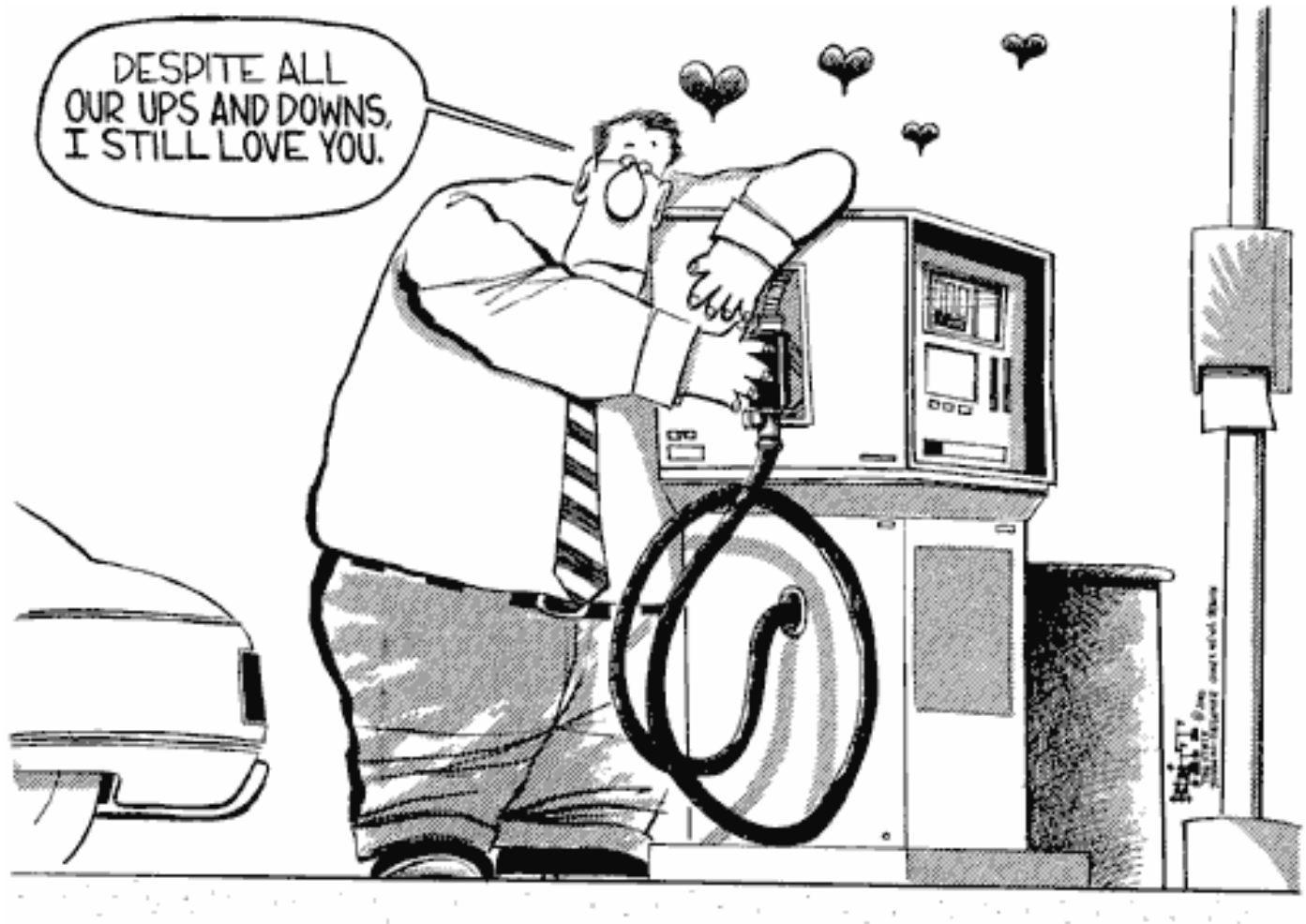
Impacts (cont)

- Gasoline production from California refineries will decline
  - Volume lost because ethanol use less than MTBE
    - 6 versus 11 percent
  - To help compensate, refiners have:
    - Increased alkylate production
    - Imported more blending components
    - Converted some conventional gasoline to RFG
  - Summer 2004 production decline estimated to be minimal

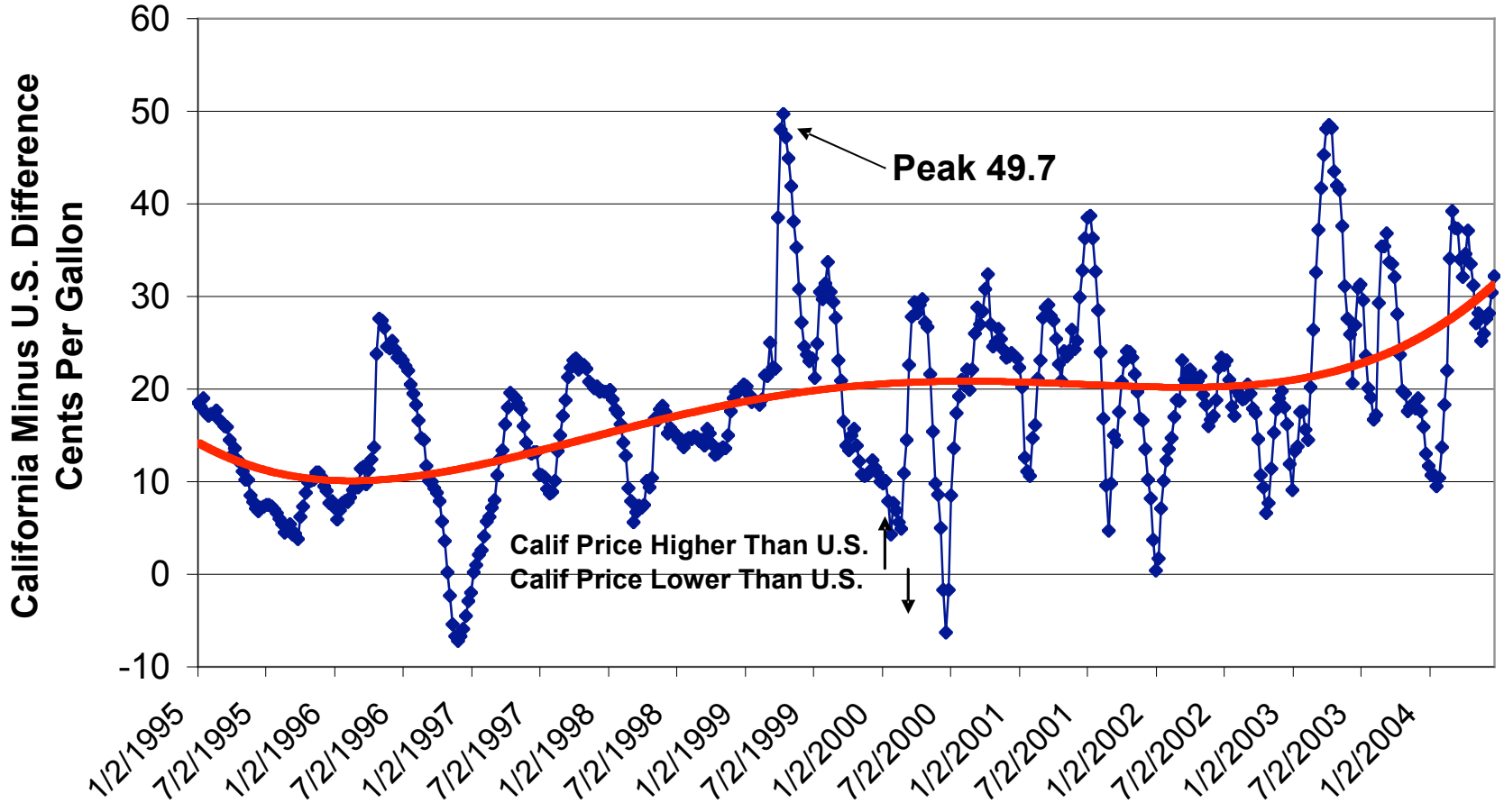
Impacts (cont)

- Demand for imported components will increase
  - Phase 3 RFG for ethanol blending is a more difficult formulation to produce for refiners outside the U.S.
  - Market price of premium blending components expected to rise
    - High octane, low sulfur & low volatility key properties
    - NY & CT phaseout of MTBE will increase competition for these products
  - Lower sulfur levels for gasoline will increase demand for imports of cleaner components

Price Issues



California Gasoline Volatility
January 1995 to June 21, 2004



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Price Issues - Differences

- California retail gasoline prices are normally higher than U.S. average
  - Higher quality, cleaner burning reformulated gasoline is more expensive to produce than other types of gasoline sold throughout the rest of U.S.
  - California is a net importer of gasoline and blending components to meet demand, adding to the supply costs
  - Steadily increasing demand for transportation fuels
  - Declining spare refining capacity & inventory levels
  - The elimination of MTBE has reduced the supply of gasoline in California
  - Higher than average fuel taxes
- The average difference has increased from just over 10 cents in 1995 to over 27 cents since January of 2003

Price Issues - Volatility

- Volatility (price swings) has also increased
  - Market is geographically isolated from alternative sources of supply by 2 to 6 weeks
  - Refinery problems have resulted in price spikes, some times in excess of 50 cents per gallon
  - Greater volatility could continue if quality imports become scarce or the infrastructure to handle the additional volumes is further constrained